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HOUSING CHANGE AND PERCEIVED HOUSING QUALITY IN A NORTHERN ALBERTA BOOM-TOWN *

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Abstract

Inadequate housing stocks poor housing quality and high housing costs are problems faced by many migrants to rapidly growing resource towns. Survey data from a northern Canadian boom-town demonstrate how the changing housing mix in such a community requires many migrants accustomed to single family dwellings to move into mobile homes or some form of multiple-family dwelling. Housing subsidies from employers are common but are most likely to go to the more affluent and to home-owners. There is evidence that dissatisfaction with housing type, neighbourhood environments, and housing design may be responsible for high rates of residential mobility. Multiple regression results show that housing and neighbourhood characteristics are more important than are individual characteristics as predictors of residential stability and housing satisfaction. The single family dwellings which migrants left behind are clearly preferred over the higher density multiple-family types of housing which are becoming common in rapid growth resource communities.

Housing Supply and Quality in Rapid Growth Resource Towns

The growing demand in the 1970s for secure supplies of energy resources led to the creation of a number of "instant" communities in the Western U.S.A. and Canada as huge new mines, dams or power plants were built. In addition, many small communities in these energy resource-rich areas suddenly "boomed". Hundreds and in some cases thousands of construction workers arrived to take up employment. They were succeeded by somewhat smaller but still sizeable operations phase workforces. Hence, community populations often increased much faster than local or state/provincial agencies could provide the necessary community services. Housing stocks frequently were inadequate and builders could not keep up with the demand. The literature documenting these service and housing provision problems and their reputed effects on the adjustment of migrants and the indigenous population is, by now, extensive. It contains many studies of specific development projects and their social impacts, summaries of a variety of studies (Finsterbusch, 1980:137-60), and collections of papers on the topic (Summers and Selvik, 1982) including complete issues of The Social Science Journal (vol. 16 no. 2; April, 1979) and the Pacific Sociological Review (vol. 25, no. 3; July, 1982).

Another research literature on Canadian "single industry communities" has existed for a longer time (e.g. Queen's University, 1953; Robinson, 1962; Lucas, 1971; Riffel, 1975; Stelter and Artibise, 1978; McCann, 1978; Bowles 1982). Although there is a broader range of subjects addressed in these studies, some of the concerns about housing provision problems caused by very rapid population growth are familiar. Thus we find, in both types of studies, accounts of populations too large for existent housing stocks, of the widespread use of mobile homes as a quick and relatively inexpensive solution, of subsidized or company housing as a solution for employees of the major firms, and of residents' frequent dissatisfaction with the supply and quality of housing.

Because of the location of mineral and petroleum resources, many of Canada's single industry communities have been built in relatively isolated and sometimes inhospitable northern locales. In such cases, the difficulties of providing sufficient

housing as quickly as possible are complicated by the problems of importing all of the building materials, building in difficult terrain and in an unfavourable climate, and competing with plant and mine construction for very expensive labour.

An additional issue of appropriate housing and neighbourhood design for new northern Canadian communities has concerned many urban planners. Some have argued for fairly high density, multiple unit housing complexes that are designed to "fit" into the northern landscape. It is reasoned that this type of housing is less costly and less difficult to build, that it will not impose an alien urban look on a northern landscape, and that the housing density will encourage community interaction among new arrivals in the town. But most migrants to such communities come from a highly urbanized "south" and leave behind a lifestyle of which single family housing is an important part. Riffel (1975:16) suggests that the absence of single family housing in Canadian resource towns may discourage potential migrants. Siemens (1976:280) argues that the uprooting experience of migration results in attempts to maintain prominent parts of an earlier lifestyle. This, in conjunction with a strong societal value placed on privacy, means that "when planners have attempted to compensate for the bitter winter climate by proposing a denser housing pattern, the residents have either vetoed these plans in advance or complained bitterly once they arrived on the scene" (Siemens, 1976:279). Hence, new town planners are often criticized (by other planners) for transporting north the unimaginative suburbs of the south (Robinson, 1962:138; Pressman and Lauder, 1978:91; Gertler and Crowley, 1979:256). When they have tried to design innovative housing and neighbourhoods, they have been criticized by residents of the new towns for failing to provide the private, single family bungalows which they want.

Housing satisfaction has been shown to be an important determinant of residential stability in more typical urban settings (Speare, 1974; Speare et al., 1975; Bach and Smith, 1977), and the quality of housing has been found to be an integral dimension of the quality of life in general (Campbell et al., 1976; Zehner, 1977). Studies of the quality of life and of population turnover in northern Canadian resource communities have identified satisfaction with housing supply and quality as important factors influencing residents' community satisfaction and their intentions to remain

(Jackson and Poushinsky, 1971; MacMillan et al., 1974; Riffel, 1975; Porteous, 1976; Bradbury, 1980). Since unusually high turnover rates appear to characterize many Canadian resource towns (and presumably American energy resource towns), there is practical value in examining some of the relationships between housing supply and quality, and residents' satisfaction with housing, in a contemporary Canadian energy resource community.

This exploratory study uses 1979 survey and other secondary data to examine issues of housing supply and quality, housing costs and subsidies, residential stability, and housing satisfaction in Fort McMurray, Alberta. This community is a single industry town located in a relatively isolated northern setting. It is also a community that has "boomed" in response to world demands for oil in the 1960s and 1970s. We begin by examining changes in housing supply as Fort McMurray went through two construction booms, and changes in residents' own housing as a consequence of migration to this rapidly growing town. We then consider whether some residents experience less difficulty in obtaining good housing because of subsidies provided by employers. Finally, we turn to a multivariate investigation of both residential stability and of housing satisfaction.

Fort McMurray, Alberta: a Rapid Growth Energy Resource Community

Regional disparities in economic growth and industrial diversity characterize the Canadian economy, resulting in different income levels, unemployment rates, and standards of living in different parts of the country (Phillips, 1978). These differences lead to migration of younger, often more educated Canadians to the regions where employment opportunities are better and more plentiful (Grant and Vandercamp, 1976; Cuneo, 1978). The more heavily industrialized province of Ontario has traditionally offered employment to those leaving either eastern or western provinces. However, during specific eras of their development resource communities in other regions of the country have also attracted migrants. Mining towns such as Sudbury, Thompson, and Eliott Lake which grew rapidly in response to world market demands for their mineral resources, are typical examples (Clement, 1981:42,49,58). In the last few decades, the oil and gas boom in Alberta has dramatically altered the economic and

social structure of the province (Richards and Pratt, 1979). High incomes, low unemployment rates, and high levels of in-migration were common during the 1970s (Statistics Canada, 1980:104,90,16), and communities specializing in oil and gas production attracted many of the migrants seeking jobs and better incomes. Fort McMurray attracted the most.

Fort McMurray is located about 450 km north of Edmonton, the provincial capital. This energy resource town is situated in the southern part of the huge region containing the Athabasca oil sands deposits. Some of these deposits, consisting of sand saturated with oil (up to 13%), are close enough to the surface to be strip-mined, but this resource was not commercially exploited until the 1960s. Instead, Fort McMurray's almost 200 year history as a settlement is a story of fur trading and river transportation, for the settlement was an important terminus linking central Alberta with the Canadian north.

In 1961 the town's population was still around 1200. Construction of the first large mine and extraction plant/refinery (Great Canadian Oil Sands, now Suncor) in that decade increased the population to 6000 by 1971. With the construction of Syncrude, the second and larger mine and plant, the population grew to 26,000 by 1979 and has continued to increase to over 32,000 today. Suncor was built between 1963 and 1968 with a peak labour force of 2300. It now employs between 1500 and 1800 workers and in 1979 produced an average of 45,000 barrels per day (BPD) of synthetic crude oil. Syncrude was built between 1973 and 1978 with a peak construction labour force of about 7000. The project (excluding the power plant and any community infrastructure costs) required $2.3 billion and has a design capacity of 125,000 BPD. It employs an operations labour force of about 3500.

Acute housing shortages and high housing costs existed in both construction eras, but there is more available information on the more recent Sycrude building boom. In a participant observation study carried out in 1976, the researchers found themselves in a situation where "accomodation [was] totally unavailable, [and] we could find no area into which a trailer could be moved for six months" (Van Dyke and Loberg, 1978:31). This was so despite the fact that up to 6600 construction workers

lived in an on-site construction camp. The researchers concluded that, at the time of their study, the entire social structure of the community could be understood in terms of three categories: (1) single men accomodated in the camp, (2) people living in Fort McMurray who received housing subsidies from their employers, and (3) everyone else (Van Dyke and Loberg, 1978:37).

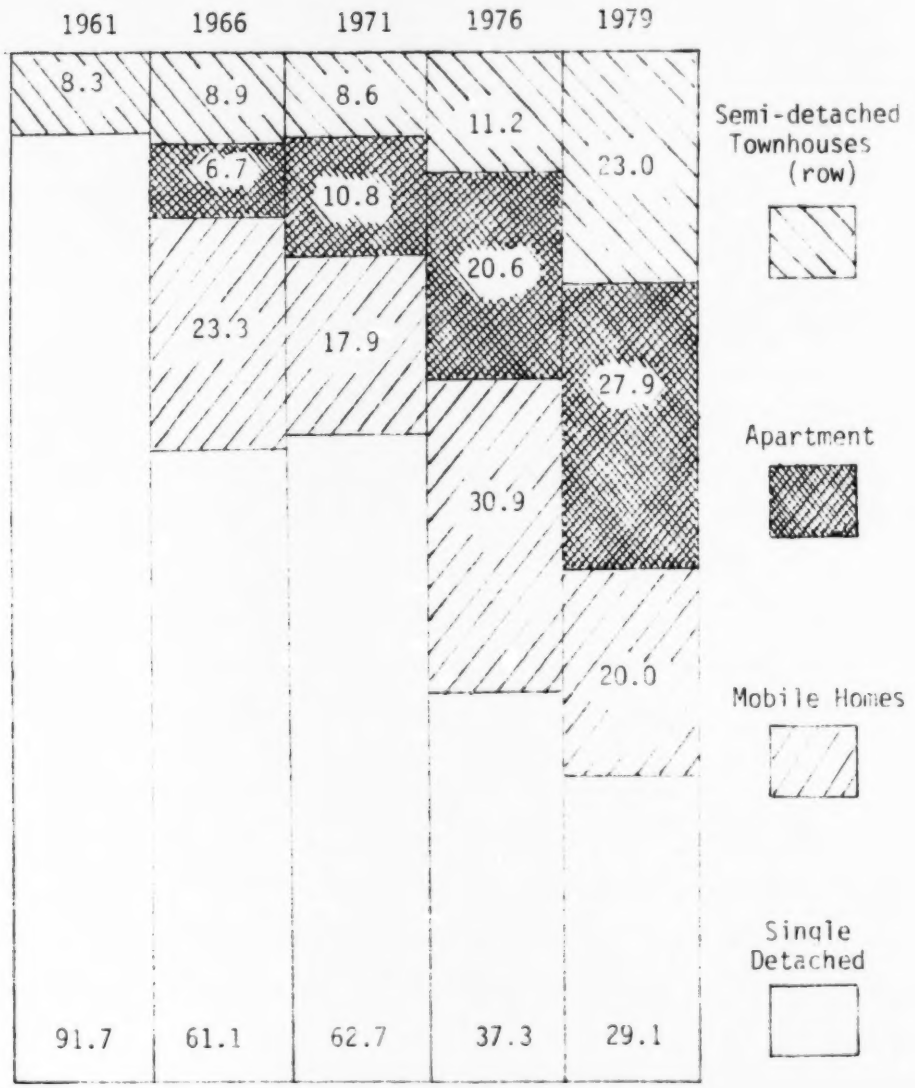
As the community moved into the Syncrude operations era, the situation improved somewhat. The supply of housing began to approach the demands of the population and housing costs appeared to drop. For example, a three bedroom mobile home that rented for $600/month in 1977 was available for $450 to $475 in 1979 (Nichols and Associates Ltd., 1979:112). But housing costs remained about 18% to 21% above those in Edmonton, and Edmonton's housing costs were among the highest in Canada.

The housing stock in Fort McMurray has increased rapidly as oil sands development proceeded. Census results show that in 1961 there were only 301 dwelling units in Fort McMurray (Figure 1). By 1966, during the construction of Suncor, the housing stock had grown by 103% to 610 units. In 1971, 3 years after construction was completed, the housing stock had grown by 166% to 1620 units. With Syncrude's construction underway, there was a further increase of 195% from 1971 to 1976, and a year after construction was completed (1979) there had been a further increase of 105% over 1976.

The composition of housing stocks also changed dramatically over these two decades. Fort McMurray's 1961 housing mix had 92% single family dwellings and only 8% semi-detached units (Figure 1). By 1979, the total housing stock contained only 29% single detached dwellings and relatively even proportions of semi-detached units, apartments, and mobile homes.[1] Mobile homes, identifying features of rapid growth communities (McCann, 1978:53; Lewis and Massey, 1979), maintained a fairly prominent presence throughout this period (around 20%) with a sizeable increase during the

[1]By June of 1981, there were 9899 housing units in Fort McMurray (City of Fort McMurray, 1981). Housing type percentages were: single detached (36%), semi-detached (22%), apartments (24%), and mobile homes (18%). Thus there seems to be a small movement towards more single family dwellings but it is unlikely that the 1971 proportion will again be approached.

Figure 1 Housing Stocks in Fort McMurray (1961-1979).*



* Composition of housing stocks in Fort McMurray, 1961 to 1979. Adapted from Nichols and Associates (1979:103) who use Canadian census results for 1961 to 1976, and New Town of Fort McMurray (1979:7). The category of "other" housing is omitted. Numbers in the figure represent percentages.

Syncrude construction boom (up to 31%). Both semi-detached dwellings and apartment units recorded progressively larger shares of the housing stock as the town grew. They could be built quicker and cheaper, thus reducing the high development and building costs associated with single family dwellings and the longer lead time necessary to plan and construct such developments. The larger of these projects included the downtown apartment towers and the high density multiple dwelling neighbourhood (Abasand Heights) built for Syncrude employees. The latter project, housing about 3500 people, won an award for its innovative design.

Survey Design and Sample Characteristics

Data for this analysis were obtained from a 1979 survey of 430 Fort McMurray residents (Gartrell et al., 1980). A sample of dwellings was initially selected in a fixed interval sampling design. Then one adult was randomly chosen as respondent in each selected dwelling. About 77% of those contacted completed the hour-long structured interview which focused on a wide variety of aspects of life in the town as well as on relevant events preceding migration to this community. Comparisons to the 1979 Fort McMurray Municipal Census showed that the sample slightly under-represented males but was representative of the community in terms of industrial sector of employment, marital status, age, length of residence in the community, housing type and tenure, and household size.

Fifty-four percent of the respondents were women. 77% reported their marital status as married, common law or separated, and average household size was 3.48 persons. The comparable Canadian parameters are 76% married, common law or separated, and 3.10 persons per household. Respondents' average age and education were 31.6 and 12.2 years, respectively. About one-half of the sample had lived in Fort McMurray for less than two years. In short, the survey estimates portray a community of young, geographically mobile families with fairly well educated adult members. They also demonstrate that the community's extremely rapid growth has made pre-development residents into a very small minority. Only 3 of the 430 sample members had always lived in Fort McMurray.

Survey Results

Housing Subsidies

Housing subsidies play an important part in Fort McMurray's housing market. The Alberta Housing Corporation subsidizes provincial government employees, and Northward Developments Ltd. and Athabasca Realty do the same for employees of Syncrude and Suncor, respectively. In addition, "hidden subsidies" such as cable television, recreation centres, and laundry units improve the quality of housing for oil company employees (Nichols and Associates Ltd., 1979:112).

Respondents in the 1979 survey reported average shelter costs (rent or mortgage plus taxes) of $356 per month. About 46% paid $400 or more, and 20% paid $500 or more. Average shelter costs would have been considerably higher in the absence of employer subsidies, which were reported by 46% of the respondents. Home ownership had been subsidized for 9% of the sample. 15% reported lease-purchase arrangements, and rent subsidies were reported by 22% of the respondents. Single dwelling residents were most likely to be subsidized (69% of this group), usually via lease-purchase agreements. Mobile home residents were least likely to be the recipients of shelter subsidies (18% of this group).

A better understanding of the distribution of housing subsidies is obtained by cross-tabulating the percentage of those subsidized by housing tenure (own and lease-purchase versus renters) by 1978 total household income (Table 1). The cutting point of $25,000 per year income approximates the mean household income for the sample. Owners were more likely to report subsidies than were renters. In addition, among both owners and renters, those with higher incomes were more likely to report subsidies than were those with relatively low incomes. This evidence suggests that housing subsidies tend to increase the material avantage of those who are relatively "well-off", rather than helping those with lower incomes.

Table 1 also divides the sample by length of residence in Fort McMurray with 18 months as the cutting point. While relative newcomers were much less likely to own their homes, there is not an important difference in the percentage of

Table 1: Percent receiving housing subsidy by tenure status, income and length of residence in Fort McMurray.

	Income		Length of residence	
Tenure status	Below $25,000	$25,000 or more	Below 1.5 years	1.5 years or more
Own or lease-purchase	47.6% (63)	57.3% (103)	47.2% (36)	51.9% (154)
Rent or "other"	35.1% (114)	50.8% (67)	39.7% (136)	38.5% (91)

[a] Sample sizes for each cell are reported in brackets. Missing data for the income variable reduced the frequencies in the income portion of the table.

newcomers and longer-term residents who received housing subsidies. Thus, housing subsidies do not appear to be differentially distributed by length of residence. Alternatively, there is no evidence that housing subsidies lead to longer periods of residence for their recipients, although a longitudinal research design would be necessary for us to draw firm conclusions.

Residential Mobility and Length of Residence in Dwellings

Residential mobility in Fort McMurray remained high in 1978. Fifty-three percent of the sample had lived in their dwelling for less than one year. Only 8% had not moved in the previous 5 years. Comparable statistics from a 1979 survey in Edmonton were 20% with less than one year in their residence and 39% with 5 or more years (Population Research Laboratory, 1979). The Fort McMurray statistics reflect considerable residential mobility beyond that associated with recent migration to the community. Sixty percent of the sample had moved within Fort McMurray and 30% had moved twice or more. This high level of inter-urban mobility may reflect difficulties in obtaining satisfactory housing.

If migrants to resource towns prefer to find housing similar to what they left behind (Riffel, 1975; Siemens, 1976), it would be instructive to examine this sample's experiences in this regard. Prior to moving to Fort McMurray, 58% of these respondents had been living in single detached dwellings (Table 2). On arrival in Fort McMurray, only 19% had obtained this type of housing and by the time of the survey in 1979, 29% were living in single family dwellings. The proportions living in apartments were roughly similar at these three time-points. The probability of living in a mobile home or some kind of multiple-unit housing complex was considerably higher following migration than before migration.

The above analysis is cross-sectional. It identifies the probabilities, for individual sample members, of living in a particular type of housing at three points in time. It does not examine the sequential housing experiences of individual sample members who migrated to and settled in Fort McMurray. Cross-tabulation of house type on arrival in Fort McMurray by house type before moving (results not displayed) showed a

Table 2: Dwelling type before migrating, on arrival, and at the time of interview (1979).

Dwelling type	Before moving to Fort McMurray	On arrival in Fort McMurray	At time of interview [a]
Single detached	58%	19%	29%
Apartment	22%	27%	20%
Semi-detached	12%	27%	25%
Mobile home	8%	27%	26%
Total	100%	100%	100%

[a] This housing type distribution does not match the 1979 housing stock distribution in Figure 1, since the latter was obtained from Municipal Census results while this distribution is produced from sample data.

lack of significant association. Migration was so "disruptive" that there was no systematic pattern linking housing type before the move with housing type after the move! Only 21% of the 238 respondents who left behind single detached housing obtained that type of housing on their arrival in Fort McMurray. Considering all four broad housing types, only 27% of the respondents had the same type of housing before and after the move to Fort McMurray. Of those who had to accept a different housing type, over twice as many "lost" single family housing as "gained" it. In this sense, moving to Fort McMurray represented an improvement in housing for only a few and a loss for many more.

Thus, residents of this community typically did not find housing resembling that which they left behind. Similar findings have been reported in other rapidly growing resource towns (Massey and Lewis, 1979:88). In addition, the Fort McMurray survey data provide support for the argument that migrants are dissatisfied with this fact of life in boom towns. In response to the statement "It's hard to get the kind of housing you really want," 46% of the sample agreed strongly (a score of 7 on a 7-point scale). Less than 15% disagreed at all (scores of 1, 2 or 3).

The low probability of obtaining single family housing in Fort McMurray is obviously a product of the specific composition of this community's housing stock. People arriving in the community must choose from a supply of housing with relatively high proportions of multiple unit dwellings. It follows that migrants who arrived in early cohorts would have faced housing markets characterized by proportionately fewer multiple family dwellings (Figure 1). Furthermore, those who arrived earlier would have had more opportunity to move to desirable housing, despite its short supply. Assuming that single family housing is most desirable, this would suggest higher proportions of earlier cohorts with single family housing on arrival, and also at the time of the interview (1979). Accenting this second trend might be higher rates of out-migration among those unable to find single detached housing.

Examination of the survey data supports these hypotheses. About 27% of those who arrived before June of 1975 found single detached housing on arrival, compared to 25% of those arriving between June of 1975 and January of 1978, and only 9%

of those arriving in the 18 months prior to the survey. At the time of the interview, cohorts with longer residence in Fort McMurray had a higher proportion of single housing and a lower proportion of apartments and other multiple family dwellings. Using the same cutting points to identify three migration cohorts, we find 51%, 38% and 10% with single detached housing at the time of the interview. In short, people who arrived later were more likely to live in multiple family housing because there was more of it. Those who arrived earlier were able to enter a housing market with higher proportions of single dwelllings, and had also had more opportunities to move to a preferred type of housing.

It appears, then, that housing type and length of residence in Fort McMurray are associated with residential stability. Housing quality, housing costs, individuals housing needs and preferences, and neighbourhood characteristics could also affect respondents' decisions about staying in or moving out of a specific dwelling. To determine what kind of factors most strongly affect residential stability, a stepwise multiple regression analysis was performed with years resident in present dwelling as the dependent variable. Residents averaged 1.85 years in their dwellings. Thirty-four percent had lived there for less than six months and 54% had lived in their current dwelling for a year or less. Average length of residence in Fort McMurray was 3.2 years. Thirty-two percent had lived in the community for less than one year and 53% for less than two years.

Table 3 contains a reduced form multiple regression equation (only those independent variables with statistically significant effects). Variables initially considered as possible predictors included measures of characteristics of the dwelling, of its enviornment, and of residents of the dwelling. Included among the variables which did not have significant net effects on housing stability were gender, education, marital status, number of children, and previous residence in another resource town. Thus, individual characteristics seem to be relatively unimportant in determining housing stability in such a setting.

Length of residence in Fort McMurray had a significant effect on residential stability but its relatively small size (b = .22) reinforces the impression of high levels

Table 3: Housing stability within Fort McMurray: reduced form multiple regression equation.

Variable	B	St. error	Beta	F[a]	r
Years resident in Fort McMurray	0.223	0.025	0.387	80.44	0.568
Single dwelling	0.763	0.233	0.152	10.70	0.412
Live in Waterways	-1.044	0.514	-0.083	4.13	-0.055
$'00 shelter costs	-0.247	0.052	-0.189	22.62	-0.160
Own home	0.619	0.222	0.139	7.49	0.365
R's age (years)	0.029	0.009	0.123	10.00	0.378
Live in Lower Town	1.202	0.209	0.267	32.99	0.195
Household possessions index	0.148	0.043	0.149	11.83	0.325
Prior mobility	-0.070	0.030	-0.089	5.59	-0.287
Work for oil companies	0.449	0.196	0.098	5.25	0.119
Live in Gregoire Park	1.163	0.371	0.170	9.85	-0.016
Mobile home	-0.731	0.284	-0.141	6.60	-0.061
Constant	-0.604				
	R^2 = 0.558		F = 37.53		N = 370 [b]

[a] All effects are significant at the .05 level.

[b] Only cases with complete data for all variables are included.

of residential mobility in this resource town. Those who had moved between communities more times in the previous five years (prior mobility), had lived in their present dwelling a shorter time, controlling on length of residence in Fort McMurray. Age also had a positive net effect on residential stability. These three variables can be considered control variables in this equation. Their inclusion allows us to look at the effects of other variables, controlling on maximum possible housing stability (length of residence in the community), and on individual differences in mobility tendencies (age and previous history of mobility).

While housing subsidies had significant zero-order effects on residential stability, they do not appear in this reduced form equation. The effects of subsidies may be indirect via employment with oil companies (either respondent or spouse) or housing costs. Lower housing costs (which can be a product of housing subsidies) translate into longer residence and oil company employment (with a high probability of receiving housing subsidies) is also associated with residential stability. Respondents with employment links to Suncor or Syncrude had lived in their homes an average of 0.45 years longer than had other sample members.

Home owners had lived in their homes an average of 0.62 years longer than had non-owners, and those with more household possessions were also more residentially stable, controlling on other important variables. Residents of single dwellings were more stable while mobile home residents had lived in their dwellings a significantly shorter time. While housing type variables were important predictors of residential stability, housing size indicators (e.g. number of bedrooms or bathrooms) were not. Finally, area of residence - the neighbourhood environment factor - was also important. Residents of Waterways (older housing, poorer quality mobile homes, and a flood-prone area) had lived in their dwellings a shorter time. Gregoire Park residents (better quality mobile homes) and Lower Town residents (older area with a mix of housing types) had been in their homes a significantly longer time than had residents of the newer sub-division (Beacon Hill, Abasand Heights, and Thickwood Heights).

Summarizing these multiple regression results, we find the expected evidence that length of residence in the community, age, and previous residential instability have net effects on respondents' length of residence in their dwelling. Independent effects of housing type, neighbourhood environment, housing tenure and housing costs were also identified, as well as the possible indirect effects of housing subsidies. Hence, it is difficult to conclude that high rates of residential mobility in this community are simply a result of highly mobile people being attracted to the community. Also, since individual characteristics are relatively unimportant predictors of residential stability, we might conclude that personal preferences in housing are difficult to express in this community.

Residents' Perceptions of Housing Quality

Linking housing type and neighbourhood characteristics to individuals residential stability implies that their perceptions of housing quality (PHQ) intervene between the market and individual factors that are exogenous, and decisions to move or stay in a residence (Speare et al., 1975; Nickels et al., 1976). In the following analyses we examine the effects of three types of variables on PHQ: (1) objective factors such as housing type, tenure, costs and subsidies; (2) housing "environment" factors such as neighbourhood within Fort McMurray, and respondents' assessments of their neighbourhood and of difficulties getting preferred housing, and (3) individual characteristics (e.g. age, gender, social status, employment status, length of residence in the dwelling).

Respondents' evaluations of 12 specific features of their housing were used to construct the PHQ index. The percentage of the total sample and of community area sub-samples which evaluated each of these features as "poor" are presented in Table 4. It is apparent that respondents rated many features of their housing rather negatively, and that external design features were systematically evaluated more negatively than were interior design features. For example, over 35% of the sample rated landscaping, places for children to play, privacy, outside space, and noise as poor. Only around 20% said that room design and interior space were poor, and 11% said the same about the interior condition of their dwelling. It is also clear that

Table 4: Respondents' evaluations of housing features by sub-community.

Design feature	Area of town						
	Lower Town	Water-ways	Beacon Hill	Gregoire Park	Thickwood Heights	Abasand Heights	Total Sample
	Percent "poor quality" [a]						
Landscaping	40.7	56.2	19.4	45.1	46.8	43.1	41.7
Child space	53.6	33.3	5.4	39.2	27.7	50.0	40.7
Space outside	40.6	25.0	16.2	34.0	31.9	55.2	37.2
Privacy	33.7	37.5	13.5	45.1	31.2	53.4	35.6
Noise	35.7	50.0	13.5	27.4	31.5	43.1	35.5
Storage	30.4	37.5	18.9	46.0	22.3	37.9	30.7
Insulation [b]	19.9	26.7	17.6	35.3	32.9	30.4	25.9
Parking	24.6	18.8	10.8	39.2	16.0	41.4	25.3
Exterior condition [b]	24.3	37.5	10.8	15.7	25.5	27.6	23.3
Space inside	19.8	37.5	8.1	29.4	20.2	37.9	23.1
Room design	19.8	18.8	8.1	21.6	14.9	37.9	20.3
Interior condition	12.9	31.2	5.4	6.0	7.4	10.5	10.6

[a] "Poor quality" represents scores of 1, 2 or 3 on a 7-point "very poor (1) - (7) very good" rating scale. Sample sizes vary slightly by item, since "don't know" responses were omitted from percentage calculations. Only insulation drew a sizeable proportion of these responses and its sample size was 397.

[b] These differences between sub-communities were not statistically significant at the .05 level.

residents of some areas of the town, particularly the new Abasand Heights sub-division, were very critical of the quality of their housing.

Sample members were also relatively dissatisfied with their neighbourhoods. About 40% of the Fort McMurray sample, compared to 72% of an equivalent Edmonton sample (Population Research Laboratory, 1979), said that they were highly satisfied with their neighbourhood (scores of 6 or 7 on a seven-point scale.[2] This is a large and statistically significant difference between these two samples. The PHQ index, an average of the 12 items in Table 4 with high reliability (Alpha = .84), was strongly correlated with neighbourhood satisfaction (r = .550) in Fort McMurray. It was also negatively associated (r = -.340) with responses to the statement "It's hard to get the kind of housing you really want." Those with high neighbourhood satisfaction and those who had experienced fewer problems in the local housing market tended to evaluate their housing more positively.

The reduced form multiple regression equation displayed in Table 5 is the product of an analysis which began with a much larger list of independent variables. They were housing size, type, tenure, cost and subsidy measures, demographic variables (age, gender, education, marital status, and number of children), employment indicators (full time employed versus all others, household member employed with an oil company), mobility measures (length of time in the community and in the residence, previous residence in a resource town), area of town dummy variables, and subjective measures of neighbourhood satisfaction and of difficulties experienced in the housing market. The dependent variable, the PHQ index, was transformed into a 0 to 100 scale. Only those variables with statistically significant net effects are included in the multiple regression equation which accounts for 40% of the variance in PHQ.

Environmental factors dominated the results. Neighbourhood satisfaction was the most important predictor of PHQ (Beta = .451). Respondents' attitudes toward the housing market also had a significant impact on PHQ ratings. The more problematic the respondent perceived his or her position in the housing market to be, the lower the

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[2]The 1979 Edmonton Area Study, a third survey in an annual series, was directed by Les Kennedy and Herb Northcott. The randomly selected sample contained 440 respondents.

Table 5: Perceived housing quality index (PHQ): reduced form multiple regression equation.

Variable	B	St. error	Beta	F[a]	r
Neighbourhood satisfaction	5.306	0.524	0.451	102.60	0.550
Number of bathrooms	3.907	1.431	0.123	7.46	0.209
Hard to get good housing	-1.673	0.436	-0.163	14.69	-0.340
Single dwelling	8.115	2.110	0.196	14.80	0.345
Live in Thickwood Heights	-5.690	2.007	-0.126	8.04	0.043
Years resident in dwelling	-1.288	0.385	-0.162	11.18	0.089
R's age (years)	0.223	0.087	0.115	6.62	0.203
Constant	29.338				
	R^2 = 0.400		F = 35.67		N = 382 [b]

[a] All effects are significant at the .05 level.

[b] Only cases with complete data for all variables are included.

housing evaluation. These effects were present even after adjusting for neighbourhood satisfaction, house type, and respondent characteristics. The third significant environmental effect on PHQ was an apparent negative effect on living in Thickwood Heights. Other things being equal, respondents who lived in that area rated their dwellings 5.7 points lower than respondents who lived anywhere else. Of course, other things are not equal and the observed average PHQ for Thickwood Heights was 60. This was higher than the average PHQ for Waterways (58), Gregoire Park (55), Lower Town (57), and Abasand Heights (52). Indeed, from the observed results one would conclude that the big difference was whether or not respondents lived in Beacon Hill ($\bar{x}$ = 72). Variables introduced into the equation accounted for this difference. Beacon Hill, the most desirable housing area in Fort McMurray, had a high average PHQ rating because it had high neighbourhood satisfaction, large dwellings, and a high proportion of single housing. Only when PHQ was adjusted for these three variables were scores for Thickwood Heights significantly lower than those for other areas. Distance from the business centre of town and the lack of public transportation may be negative factors for those living in the still developing Thickwood Heights.

The very low PHQ ratings given by residents of the recently developed Abasand Heights (housing Syncrude employees) also appeared to be largely explained by differences in neighbourhood satisfaction. The small but significant zero-order negative effect of living in this area of Fort McMurray (r = -.110) disappeared when neighbourhood satisfaction was controlled. Examination of sub-community differences in evaluations of the specific housing features comprising the PHQ index showed that Abasand Heights residents were among the most negative of any residential group about outside space, area for children to play, parking, privacy, amount of noise, interior space, and room design. All of these could be attributed to the high density of this large housing complex. Thus, lower "neighbourhood" satisfaction in such a housing development might well mean dissatisfaction with the high density design.

Single housing was perceived to be of overall higher quality than were all other types of housing. The observed means for mobile homes (53), apartments (52), and other multiple dwellings (56) were very similar. Single detached housing ($\bar{x}$ = 68) was

clearly different, and remained so after controlling for the effects of other variables in Table 5. A second "objective" characteristic of the house, the number of bathrooms, also had a significant effect on PHQ. The number of bathrooms provides an indirect measure of both house size and amenities. One-way analysis of variance results showed that dwellings with one bathroom averaged 55 points on the PHQ scale, those with two bathrooms averaged 61, and those with three or more averaged 74. After adjusting for the effects of other variables in the equation, respondents scored their house 3.9 points higher for each additional bathroom.

Ownership status differences in PHQ were not significant when other factors were taken into account. While the observed correlation between ownership and PHQ was positive and significant (r = .251), by the time single housing was entered into the equation the partial effects of tenure status on PHQ were not significant.

Socio-demographic characteristics of the residents had relatively small independent effects on perceived housing quality. None of the demographic, employment, or housing cost factors except age and length of residence in the dwelling had significant net effects on the dependent variable. Older respondents evaluated their housing more positively. This may reflect more realistic or practical housing aspirations, or a certain comfortableness with surroundings. Years in the dwelling had effects opposite to those expected. Housing stability was expected to lead to higher PHQ on the assumption that those who stay longer in a dwelling come to like it more. Indeed, the observed zero-order effects were positive although weak (r = .089). Those who had lived longer in their dwellings rated them more positively. However, when other factors were adjusted, these effects changed markedly. The positive effects of length of residence in the dwelling appeared to be a function of three factors: (1) neighbourhood satisfaction; (2) living in a single detached dwelling; and (3) the respondents' age. Residents with greater housing stability rated their neighbourhoods more positively (r = .198), were more likely to live in single detached dwellings (r = .416), and were older (r = .416). When the positive effects of these variables on PHQ were controlled, length of residence in the dwelling had a significant negative partial effect (b = -1.29). To put it simply, the longer people lived in their

housing, the less they liked it. Thus, it may have been a mistake to assume that Fort McMurray residents who did not like their housing would move to another dwelling. For some, the housing market may not have allowed such an option, and they might feel "trapped" in their housing. In addition, this sample did not include former residents of Fort McMurray. Perhaps, some of those who could move out of unsatisfactory housing did so, and that move may have been out of Fort McMurray.

Summary

Rapidly growing resource towns in both Canada and the U.S.A. have experienced problems of inadequate housing stocks and unsatisfactory housing quality. Planners involved in designing new communities have been faced with the choice between providing innovative, higher density housing designs and the provision of more typical, single family housing for new arrivals in the community. Survey data collected in 1979 in the expanding oil sands community of Fort McMurray, Alberta allowed the examination of changes in housing stocks, of patterns of residential mobility, of provision of housing subsidies, and of the correlates of residential stability and of housing satisfaction.

The rapid growth in housing stocks required by Fort McMurray's massive population growth in the 1960s and 1970s was accompanied by an increase in housing costs. Housing subsidies were and remain common in this community. Those residents needing them most appear to be least likely to receive housing subsidies. A dramatic change in the housing mix in Fort McMurray also followed large scale oil sands development. Mobile homes have become a prominent feature of the community and the proportion of single family dwellings has decreased while the proportion of multiple dwelling units has increased. This means that many migrants left single family housing behind and were forced to choose possibly less satisfactory alternative forms of housing on arrival in Fort McMurray.

Fort McMurray residents are quite likely to express low satisfaction with their neighbourhood and to state that obtaining satisfactory housing is difficult. Assuming that frequent residential mobility is an indicator of dissatisfaction, we find that

neighbourhood characteristics, and housing type and costs are more important correlates of residential stability than are individual characteristics of residents A multiple regression analysis of the determinants of housing satisfaction also shows house type and neighbourhood environmental factors to be strong predictors Thus, it appears that personal preferences in housing are difficult to satisfy in this community at this stage of its development The small proportion of single detached housing available in the local housing market appears to be part of the explanation since high density multiple unit housing was typically considered to be unsatisfactory In fact, the newest and most innovative of such housing complexes in the community received the most negative evaluations These results suggest that migrants to rapidly growing resource towns strongly prefer more traditional single family housing which provides extra space, privacy, and areas for children to play Fortunately for residents of this resource town, single family dwellings have increased relative to other forms of housing in the several years since the last construction boom ended This type of housing now constitutes 36% of the total housing stock, which means that a larger proportion of residents may be able to obtain a preferred form of dwelling

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